### About Engineering in Medicine & Biology Society

(Your global connection to the world of biomedical engineering)

IEEE Engineering in Medicine and Biology Society (EMBS) is the world's largest international society of biomedical engineers. The organization's 9,100 members reside in some 97 countries around the world. EMBS provides its members with access to the people, practices, information, ideas and opinions that are shaping one of the fastest growing fields in science. The IEEE EMBS Bangalore Chapter is very active in organizing various technical events this year to promote the field of biomedical and clinical engineering. The chapter has received the IEEE-EMBS Outstanding Chapter Club Award for the year 2014.

### About IEEE EMBS MSRIT Chapter

The IEEE EMB Student Chapter of M.S. Ramaiah Institute of Technology has been initiated to bring together students working in the varied domains relevant to Medical Science and Technology aspire to ameliorate the status of Biomedical Engineering, make the Biomedical Engineering students, cognizant of the scopes of this multidisciplinary field and effectuate a sense of professionalism in them. This is the place where students can apply their electronics, electrical, computer or design skills in Medical field and improve healthcare technology. Our goal is to provide students with a platform through which they can interact with clinicians and take up engineering projects in community services that will address the real problems in healthcare domain.

### Hands-on Training Program on ‘Medical Image Processing & Analysis using MATLAB’

**31 July-02 August 2014**

Venue: Department of Medical Electronics  
M. S. Ramaiah Institute of Technology  
Vidyasoudha, MSRIT Post,  
Bangalore - 560 054, Karnataka

### Objective of this training program

The field of Medical Imaging advances so rapidly that all of those working on it, Scientist, Engineers, Physicians, Educators, and Students, need to frequently update their knowledge to stay abreast of developments. Medical Images are not self-explanatory, however their interpretation requires professional skills with planned training. Both automatic & semi-automatic analysis algorithms have the advantage of repeatedly performing task of image analysis with constant quality, hence relieving the medical expert from the tedious and fatigue parts of the interpretation task. The advantage in applying image analysis in a medical application is immediately visible as it saves time or increases the reliability of an interpretation task needed to carry out an appropriate medical procedure. This workshop is intended for academic community in teaching & research, as well as practicing engineers, consultants, and programmers, as well as those in the graphics field, medical imaging professionals, multimedia specialists and students who use image processing as a tool and wish to develop a deeper understanding and create custom solutions to imaging problems in their field.

**Who can attend the workshop?**

The workshop is open to academic staff and students of all engineering disciplines and the interested persons from the industry.

**General Information**

- The number of participants is limited to 75  
- MSRIT provides boarding & lodging facilities for outstation participants with prior request and on payment basis.

The deliberations on this technical workshop include the following areas:

#### Day -1 Lab Session (9.00am - 5.00pm)

- Introduction to Medical Image Analysis in Clinical WorkFlow.  
- Mathematics & Physics behind different Medical Image Acquisition Techniques.  
- Introduction to scalar, vector & matrices, array and matrix indexing in MATLAB.  
- Understanding DICOM standards and Loading different medical image datasets in MATLAB.  
- Characterization of Image Quality, Optical Density, Dynamic Range, Contrast, Histogram, Entropy, Blur and Spread Functions.  
- Image Enhancement by Spatial domain Local Statistics based Filters.

#### Day -2 Lab Session (9.00am - 5.00pm)

- Optimal Filtering Techniques: Wiener Filter  
- Adaptive Filters: LMS Filter Design.  
- Contrast Enhancement for Mammograms.  
- Edge Detection & Edge Linking.  
- Optimal & Region based Segmentation.  
- Segmentation by Clustering Approach (K-Means & Fuzzy C Means)  
- Detection of Objects based on known Geometry (Hough Transform)  
- Active Deformable Contour Models.

#### Day-3 Lab Session (9.00am - 5.00pm)

- Representation of Shapes and Contours.  
- Polygonal Modeling of Contours.  
- Shape Factors: Compactness and Moments.  
- Fourier Descriptors.  
- Fractional Concavity.  
- Statistical Analysis of Texture.  
- Supervised Pattern Classification.  
- Unsupervised Pattern Classification.  
- Classification by Clustering Techniques  
- Probabilistic Model and Statistical Decision.

### Key facilitator:

**Mahesh Anand S.**  
**Founder, Chief Consultant & Master Trainer**  
Scientific Computing Solutions, Velachery Main Road, Chennai-600100, INDIA.


S. Mahesh Anand received his B.E degree in Electronics and Communication Engineering from Madurai Kamaraj University and M.Tech degree in Biomedical Signal Processing and Instrumentation from SASTRA University, secured Gold medal. He started his career at GE Healthcare (Formerly GE Medical Systems), at John F. Welch Technology Center, Whitefield, Bangalore with Magnetic Resonance Imaging Division, Visualization Team during the year 2004. Due to keen interest in academia and enduring passion towards teaching, he started his academic career at VIT University, Vellore.
as a faculty and associated with VIT for a period of 8+ years in various positions as Lecturer, Senior Lecturer, Assistant Professor, in the School of Electronics Engineering. His Entrepreneurial Venture, Scientific Computing Solutions, a Technology Consulting & Training Company was established in the year 2012 (January) with main focus on Soft Computing Solutions for Signal & Image processing.

Registration Details

Registration early Bird (till 05/07/2014)
IEEE EMBS members: Rs1500/-; IEEE members:
Rs 1800; non-IEEE student: Rs 2250; faculty &
researchers: Rs 2500

Late registration after(05/07/2014 to 18/07/2014)
IEEE EMBS members: Rs2000/-; IEEE members:
Rs 2300; non-IEEE student: Rs 2500; faculty &
researchers: Rs 3000

The registration fee shall be paid through demand draft in favour of “IEEE Engineering in Medicine and Biology Society Bangalore Chapter” payable at Bangalore or by Bank transfer to:

Account Name: IEEE Engineering in Medicine and Biology Society Bangalore Chapter
Account No.: 141200301000176;
IFSC Code: VIJB0001412
MICR Code: 560029070

For outside campus accommodation and other details further information contact:
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Important Date:
Last date for Registration: 18 July 2014

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